EFFICIENCY, OUTREACH AND SUSTAINABILITY OF ETHIOPIAN MICROFINANCE INSTITUTIONS

SYNOPSIS

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Introduction

In the last three decades or more, microfinance institutions (MFIs), as an effective tool, to fight poverty have been gaining wider attention in the globe among policy makers, governments, international donors, and academicians (ADB, 2000; Robinson, 2001; Barr, 2005; Herms et al., 2010). MFIs as instruments of development promise to have a key role in reducing poverty by providing financial services to the poor who have little or no access to formal financial services. MFIs are critical for poverty reduction as they could enable the poor to gradually build their assets, develop their enterprises, enhance their earning capacity, smoothing consumption, and manage their risks better (Robinson, 2001). Currently, according to Market Information Exchange (MIE) report (2009), more than 1800 microfinance institutions around the world have loaned $65 billion to about 90 million low income people

MFIs are special financial institutions which emerged with social and financial objectives (Gutierrez-Nieto, 2007). MFIs are relatively small financial institutions that have traditionally provided small loans (microcredit) to low income citizens with the objective of helping them to engage in productive activities or microenterprise (Hassen,2009).They give poor people particularly women and small businesses access to financial services. MFIs differ from traditional financial institutions in the sense that they provide services to low income customers and often provide loans without the conventional form of collateral. Moreover, they also provide skill-based training to enhance productivity and organizational support, and consciousness-building training to empower the poor. The financial services of such institutions target the poor through innovative approaches which include group lending, progressive lending, regular repayment schedules, and collateral substitutes. The fact that microfinance institutions tend not

to operate in the same way as traditional banks does not mean that they are not interested in profitability, sustainability and efficiency issues.

Empirical studies on impact assessments of microfinance institutions showed that MFIs have been successful in getting the poor out of poverty (cf: UNDP, 1996; Hulme and Mosley, 1996; Khandker, 1998; Pitt and Khandker, 1998; Remenyi and Quinones, 2000; Dunn and Arbuckle, 2001; Robinson, 2001; Robinson, 2002; Khandker, 2003; Negash, 2009; and Berhane, 2009). However, studies on MFIs also noted that the positive impacts of microfinance institutions on socio-economic welfare of the poor can only be sustained if the institutions can achieve a good financial performance and increase outreach (Harvtch, 2007; Bassem, 2010).

More importantly, for microfinance institutions to reach many poor people in the long run financial sustainability is critical. Robinson (2001) stressed that government and donor funds can supply only a tiny fraction of global microfinance demand and hence financial intermediation by self sufficient institutions is the only way that financial services can be supplied to lower-income people worldwide. For these institutions, in fulfilling their objectives in a sustainable way in the long run, efficient operation seems to be a prerequisite. It can be argued that in the future only efficient MFIs can continue their operation in the long run and provide benefits to their clients. To this end, evaluating the efficiency, outreach and sustainability status and dynamism of the MFIs is important.

Statement of the problem

MFIs are essential ingredients in the development processes of a nation as they could have positive impact in reducing poverty, promoting micro enterprises, and women empowerment. In

developing countries, including Ethiopia, MFIs emerged with unique opportunity to poor people who do not have access to commercial Banks. According to Ageba and Amaha (2001), the commercial banks operating in Ethiopia are not able to reach significant number of micro and small enterprises (MSEs) due to the transaction costs and other associated - real or perceived, risks.

Microfinance is relatively new to Ethiopia and came to appear in 1994 with the government's Licensing and Supervision of Microfinance Institution Proclamation designed to encourage MFIs to extend credit to both the rural and urban poor of the country. Following this several microfinance institutions were established and have been operating in providing access to financial services to poor, rural farmers, and people engaged in other similar activities as well as micro and small-scale enterprises and entrepreneurs. Almost all the MFIs operating in the country have both the dual mission of reaching poor clients and being financially sustainable (Amaha, 2007).

Currently, there are 29 MFIs operating in the urban and rural parts of the country and have tried to reach more than 2.3 million poor clients (AEMFI, 2010). Indeed the figure seems large in absolute terms; however, it is small in relation to the potential poor clients. Studies, such as Chao-Beroff et al. (2000) and Amaha (2008), show that the existing MFIs in the country reach only a fraction of the country's poor, i.e., 10-20 percent of the microfinance demand of the country. The MFIs so as to reach the underserved populations they need to be efficient and sustainable. Indeed, sustainability of the institution could also be determined by the extent to which the MFIs are efficient in using resources and turning them into services. In other words, they should use their resources efficiently in a way that maximize social and financial objectives.

So far, various studies have been done in Ethiopia concerning microfinance. However, most of them focused on impact of such institutions in the livelihood and well being of the poor (cf: Gobeze, 2001; Thehay and Bediye, 2002; Amaha, 2003; Borchgrevink et al., 2005; Assefa et al., 2005; Garber et al., 2006; Negash, 2008; 2009; Guesh, 2010). Notable studies on regulation and governance and ownership include Itana et al. (2003), Amaha (2005); Amaha (2008). Some performance analysis papers also Amaha (2003), Amaha (2007), Amaha (2008). However, these studies are based on simple ratio analysis. The two exceptions are those of Keriata (2007) and Ejigu (2009) who tried to evaluate the performances of Ethiopian MFIs in terms of outreach and sustainability and are found to be less rigorous in methodology. This study tries to investigate the efficiency of Ethiopian MFIs using the alternative measure of **non parametric -Data Envelopment Analysis (DEA)**.The underlying assumption of this study is that an efficient microfinance may satisfy both the interests of the institutions and their clients. MFIs in striving for efficiency need to maximize outputs and minimize inputs and in the meantime enhance growth and sustainability. Therefore, this study offers a comprehensive empirical analysis of the efficiency, outreach and sustainability of the Ethiopian MFIs.

Objectives of the study

The main objective of this study is to examine the performance of Ethiopian Microfinance institutions (MFIs) focusing on efficiency, outreach and sustainability. The specific objectives of the study include:

- To investigate the technical efficiency of the MFIs
- To determine the factors that affect the efficiency of MFIs
- To investigate the efficiency change over time of the MFIs

- To assess the outreach performance of the MFIs
- To examine the sustainability performance of the institutions
- To determine factors influencing sustainability of the institutions
- To recommend, based on the findings, on ways to improve performance of the MFIs

Significance of the study

In developing countries like Ethiopia, MFIs have a fundamental role to play in poverty reduction efforts. To this end the performance of the MFIs is key for the well being of the society and the economy at large. Despite its key role, the micro finance sector particularly on the institutions (supply side) has been rarely explored. Therefore, study aiming at investigating the efficiency, outreach and sustainability performance and dynamism of the MFIs is crucial for various stakeholders in the industry. Finding of the analysis is expected to show government and regulators policy options and also enable the management of the MFIs to improve the way in which they allocate resources that satisfy the interests of the institutions and their clients. The study is also expected to add value to the limited stock of literature on efficiency and productivity of MFIs.

Scope of the study

The study is basically on the **'supply side'** of microfinance and thus the units of analysis are the micro finance institutions that supply financial services. Though performance of MFIs can be evaluated using different dimensions, the study is delimited to the analysis of efficiency, outreach and sustainability performances. The study period has been limited to the period 2004-2009 due to the availability of data of this period.

Methodological approaches in brief

Traditionally efficiency performance of financial institutions in general and MFIs in particular has been measured by ratio analysis. But, ratios provide only partial measures of efficiency and partial efficiency may mislead when one draws conclusions on overall efficiency of MFIs. To overcome the inherent ratios limitations, alternative techniques of efficiency measurement have been developed. Indeed, these alternative measures are based on the concept of **production frontier**. The production frontier is based on the theoretical premise of a production function which represents ideally the maximum output attainable given a set of inputs. Based on the concept of frontier, **technical efficiency** is defined relative to production frontier consequently; an institution is said to be efficient if it is operating on the production frontier. Meanwhile, an institution is said to be technically inefficient when it fails to achieve the maximum output from the given inputs (detail discussion is provided in chapter three of this thesis).

In empirical works on the efficiency of financial institutions two approaches, i.e., parametric - Stochastic Frontier Approach (SFA) and non parametric - Data Envelopment Analysis (DEA) have been overwhelmingly dominating (Berger and Humphrey, 1997). Both approaches provide measures of technical efficiency as a radial distance from the best practice frontier (see chapter three of this thesis). However, each approach obtains the technical efficiency scores by utilizing different techniques. Without going much in to detail, the DEA involves the use of linear programming whereas stochastic frontiers involve the use of econometric methods (Coelli et al., 1998). As the SFA impose functional and distributional forms on the error term, the DEA does not require any functional form to be specified. Further, while the former distinguishes the

component of inefficiency in to random and inefficiency effect, the later deems any deviation from the efficiency frontier to the result of inefficiency.

Seemingly, both have pros and cons and the superiority of one over the other approach has been a subject of discussion and remains an issue in literature. For the purpose of this study, the popular non parametric **Data Envelopment Analysis (DEA)** has been chosen at least for three reasons. **First** it considers multiple inputs and multiple outputs and hence suitable for MFIs (i.e it accounts the dual objectives of social and financial).**Second** it does not require a prior assumption about the analytical form of the production function. **Third**, DEA works well with small number of observations as the case of Ethiopian MFIs. For the purpose of consistency and robustness of the results, the study also estimates the technical efficiency of the MFIs using the SFA and then tries to compare the results with those derived from DEA.

Inputs and outputs in the analysis are determined based on the dual objectives (outreach and sustainability) of micro finance institutions framework (chapter four of the thesis). Consequently, the study specifies two inputs and three outputs; the number of employees, and operating expenses are specified as inputs whereas the outputs are interests and fee income, gross loan portfolio, and number of loans outstanding. Then, the technical efficiency scores of the institutions under DEA are calculated using the DEAP version 2.0 which is a computer program developed by Tim Celli (1996). Meanwhile, the computer program, FRONTIER Version 4.1 developed by Tim Coelli (1996), is used to estimate the technical efficiency of the MFIs under the SFA.

In addition, in order to investigate the key determinant factors of efficiency of the MFIs, the study employs the so-called **two stage DEA procedure** (chapter four of the thesis for details).

More specifically, the study uses a **Tobit regression model** which regress the efficiency scores obtained from the DEA model on a number of institutional variables such as ownership structure, size, experience, sustainability etc. The reason for using Tobit model in the second stage is that the efficiency scores are bounded between 0 and 1. The Tobit regression is estimated using statistical software STATA version 11.

In the DEA one can measure the efficiencies of the microfinance institutions for a specific time only. In order to analyze the changes in efficiencies by time and identify the reasons of those changes, the study employs the **Malmquist Total Factor Productivity (TFP) index** (chapter 5 of the thesis).

Regarding objective of outreach and sustainability, though outreach in microfinance can have various dimensions, for the purpose of this thesis, outreach of the Ethiopian MFIs is evaluated based on the two primary dimensions- breadth and depth.The assessment of the sustainability of Ethiopia's micro finance institutions is undertaken in the study by using sustainability indicators- financial self sustainability, operational sustainability, return on assets, and return on equity(capital). In addition, in order to investigate the key determinant factors of sustainability of the MFIs, the study employs a **random effect model**. In this case, the dependent variable financial self sustainability is regressed on set of explanatory variables such as institutions' specific, industry specific and macro variables.

Turning to **data**, the study is based on a balanced panel data which consists of 19 Ethiopian Microfinance institutions (i.e., representing nearly 70 % of the industry) over the period from 2004 to 2009 and totals 114 observations. In fact, there are 29 MFIs currently operating in the country; however, data cannot be generated from all the MFIs as some lack sufficient data while

others are new to be included in the analysis. The data is mainly obtained from the Association of Ethiopian Micro Finance Institutions (AEMFI), National Bank of Ethiopian (NBE) and the Mix market. Additional data and double checks are made from other data sources, such as individual institutions' annual financial reports.

Structure of the thesis

The thesis is structured as follows. The second chapter provides the background of the country, giving a brief overview of the country's social and macro economic performance and financial sector development focusing on the microfinance sector. The third chapter presents the concepts and measurements of efficiency on which the thesis's theoretical framework is based. This chapter first introduces the concept of efficiency and types of efficiency- technical, alloacative and economic efficiencies. Then the parametric and non-parametric frontier techniques which enable researchers to estimate the efficiency frontier levels of firms and measure the efficiency of a firm relative to the other firms in the same industry are reviewed. More specifically, the two popular approaches viz., the parametric Stochastic Frontier Approach (SFA) and the non parametric Data Envelopment Approach (DEA) are discussed in this chapter.

Chapter four to eight are the main empirical findings of the thesis. Chapter 4 presents results of the efficiency estimates of the MFIs. Chapter five attempts to investigate the efficiency change over time (productivity change) of the MFIs using the Malmquist productivity index approach. In chapter six, the study tries to investigate the outreach and sustainability performance of the MFIs. This chapter has two main parts. The first part assesses the outreach and sustainability performance of the MFIs using descriptive and trend analysis. Meanwhile, the second part uses

econometrics model to determine the factors influencing sustainability of the MFIs. Finally, the summary of major findings, conclusions and policy implication are given in chapter seven.

Major Findings

Technical efficiency of Ethiopian MFIs is estimated using the preferred DEA approach. Under the DEA, efficiency scores are calculated for both constant returns to scale (CRS) and variable returns to scale (VRS) assumptions to shed light on the potential impact of scale differences on efficiency. Based on constant returns to scale, the study found that average technical efficiency of the MFIs ranges from 0.524(52.4%) in 2004 to 0.775(77.5%) in 2009 with an overall mean efficiency of 0.667 (66.7%). This implies that Ethiopian MFIs, on an average, could have increased their output by 33.3 % using the existing level of inputs (without any additional inputs).

Regarding the sources of technical inefficiency, it has been noticed that the observed technical inefficiency in the Ethiopian microfinance industry is due to both poor input utilization (i.e., managerial inefficiency) and failure to operate at most productive scale size (i.e., scale inefficiency).

Further, from the analysis of returns to scale, it has been noticed that majority of the institutions (78.95%) have been operating in the zone of increasing returns to scale. This implies that these institutions can increase their operating scale to gain scale efficiency.

The estimated efficency of the MFIs seem to vary by size. The Kruskal-Wallis test shows that there is statistically significant relationship between size and efficiency. Large MFIs are

performing better compared to medium and small MFIs. This implies that large MFIs are taking advantage of scale economies in the intermediation process.

The estimated efficiency of the MFIs seems to vary by ownership structure. Under both assumptions, on an average, government affiliated MFIs have higher efficiency scores in comparison to with the non government affiliated MFIs. This may be justified by the fact that they operate at large scale, have high market share and direct and indirect support from their respective governments.

The two stage DEA Tobit model revealed that size, ownership type, financial sustainability, and age are the major institution related variables having significant impact on the institution's technical efficiency. More specifically, the result indicates that size is positively and significantly related to microfinance's technical efficiency. This suggests that large MFIs are more efficient than the small MFIs. This would support the assumption that large firms tend to enjoy economies of scale. The ownership variable has a significant impact on efficiency and implies that government affiliated MFIs seem to be more efficient than NGOs and/or Individual owned MFIs. The high efficiency estimates for government affiliated institutions could be justified by high market share. Institution's financial sustainability has significant positive effect on efficiency, indicating that sustainable MFIs are more efficient than the unsustainable MFIs. Microfinance age is also found to have a positive effect on technical efficiency at 1% level of significance. This implies that experience leads to a greater capacity for MFIs to function in their activities in a more efficient way. Finally, capita asset ratio¸ debt equity ratio, average loan size, and targeting women have no significant bearing on technical efficiency of MFIs.

In the DEA one can measure the efficiencies of the microfinance institutions for a specific time only. In order to analyze the changes in efficiencies by time and identify the reasons of those changes, the study employs the DEA Malmquist Total Factor Productivity index. The empirical results of the Malmquist Total Factor Productivity show Ethiopian MFIs have experienced moderate productivity growth during the period. That is, on an average Malmquist productivity or total factor productivity increased by 3.8 percent during 2004/2005 to 2008/2009.This suggests that Ethiopian MFIs have experienced moderate productivity growth during the period.

The decomposition of total factor productivity show that the mean technical efficiency change (TEC) increased by 10.1 percent whereas mean technological change has shown a decline 5.8 percent during that period. This implies that the main source of growth in total factor productivity of Ethiopian MF industry is due to technical efficiency change.

Further the decomposition of technical efficiency change (i.e., the 10.1 percent) shows that pure technical efficiency increased by 8.9 percent while scale efficiency contributed on an average to 1.1 percent increase. This implies that during the study period the Ethiopian MFIs have experienced mainly an increment of pure technical efficiency (improvement in management practices) rather than an improvement in optimum size (scale efficiency change).

Turning to outreach and sustainability performance in the period, Ethiopian MFIs have been experiencing notable achievements in both outreach and sustainability. The results show that the indicators of the breadth of outreach- loan portfolio and number of active borrowers have expanded substantially over the period. Yet, the MFIs have reached only a fraction of the country's poor (i.e., not more than15% percent). In terms of depth of outreach the MFIs are found to have high depth of outreach in all the parameters (i.e, in terms of average loan size,

average loan balance over GNP and gender targeting) and thus the micro finance industry is targeting the lower income segment of the country. Regarding sustainability in the period, the operational sustainability and financial sustainability have shown upward trend and in the year 2009 the majority of the MFIs have already reached operational sustainability and appeared to be close to achieving financial self sufficiency.

Meanwhile, the econometrics results suggest that institution-specific variables: size, deposit to loans, loan to assets, ownership, credit risk, borrowers per staff and cost per borrowers and macro variables GDP and inflation have statistically significantly impact on the financial sustainability of the Ethiopian MFIs. More specifically, size, deposits to loans, loan to assets ownership and GDP have a positive impact, whereas cost per borrower, credit risk and inflation are negatively related to microfinance financial suitability.

Suggestions and Policy Implications

Based on the finding from the analysis of efficiency, outreach and sustainability of the MFIs, the following major policy implications can be drawn.

The empirical results under the DEA and SFA confirmed that Ethiopian MFIs are less efficient. The underperformance in realized microfinance objectives from the frontier has largely been due to technical inefficiency and is largely within the control of individual microfinance institutions. Furthermore, the analysis reveals that scale inefficiency is as equally prevalent as pure technical inefficiency in the industry. This is a due concern for managers of the MFIs and regulatory bodies. Therefore, regulators are suggested to promote competition, provide technical support and monitor periodically the efficiency performance of the industry.

The empirical results indicate that regardless of the approaches used, DECSI stands out as being one of the most technically efficient microfinance institution in the sample. This is an important finding given that DECSI has attained the dual objectives of reaching much larger scale than the other institutions and is financially sustainable and viable, and may represent a best practicing or model of MFIs in Ethiopia. Therefore managers of the MFIs are advised to explore the practice and experience of DECSI and benchmarking it in an attempt to improve their performances.

The findings indicate that majority of the MFIs are operating in sub optimal stage (increasing returns to scale). Therefore the MFIs should improve their scale efficiency by growing in size. Moreover, the findings show that larger MFIs are more efficient than medium and smaller MFIs. This implies that, Ethiopian MFIs could improve their efficiency by increasing their size; perhaps by using mergers and acquisitions options.

The results suggests that government affiliated MFIs should be promoted in Ethiopia as these MFIs are found to be more efficient, have high breadth and depth of outreach, sustainable and viable.

The empirical result shows that Ethiopian MFIs have experienced moderate productivity growth during the period. The main source of TFP growth for the MFIs has been attributed to the technical efficiency change. Though few MFIs have shown improvement in technological change, the industry as a whole has exhibited a decline in technological change, suggesting that there has been deterioration in the performance of the best practicing micro finance institutions. Further, for technical efficiency change, the result show that during the study period the Ethiopian MFIs have experienced mainly an increment of pure technical efficiency (improvement in management practices) rather than an improvement in optimum size. In general,

an important policy or strategic implication for the Ethiopian micro finance industry is that they need to pursue a technological progress through innovation, enhancement of existing service delivery and the development of more technology oriented systems in order to meet the dual objectives of reaching many poor people and becoming financially sustainable.

The significant relationship between sustainability and saving signifies the importance of saving mobilization in boosting microfinance institutions' self sufficiency and hence that Ethiopian MFIs are suggested to use deposits as a major source of fund in their loan-able funds. To this end, the MFIs should devise strategies and practices which enhance savings.

Future Research

Future work could extend this research in various directions. The study has analyzed the technical efficiency, efficiency change over time (total factor productivity), outreach and sustainability of the MFIs. One could extend the study by investigating cost and allocative efficiency of the MFIs; the link between governance and efficiency and sustainability performance of the MFIs. Further, as the study is on the supply side future research could investigate the demand side of the MFIs. This would complement the findings of the thesis.